

SUMMARY OF CHAPTER 1 PROPOSED CHANGES

Design Criteria for the Review of Sewage Works Construction Plans and Documents

Proposed Revision Date: November 1, 2017

- I. References
 - a. Primary Reference: **Rule 0400-40-02 (Regulations for Plans, Submittal, and Approval; Control of Construction; Control of Operation)**
 - b. Rule 0400-40-05 (Permits, Effluent Limitations and Standards)
 - c. Rule 0400-40-11 (Environmental Protection Fund Fees)
 - d. Rule 0400-40-16, (Public Sewerage Systems)
- II. Aspects of Rule 0400-40-02 **not implemented in the current** General Engineering Requirements (Chapter 1 of *Design Criteria for Sewage Works*)
 - a. Review of wastewater treatment plant (WWTP) projects (regardless of size and including industrial wastewater) requires a 4-step process emphasizing preliminary design phase submission (Engineering Report and Preliminary Plans submission) rather than only final submission review.
 - b. Permitting application process linked to WWTP project construction document reviews at the preliminary design submission as well as the final design document submission.
 - c. DWR required to define requirements for engineering design submittal
- III. Circumstances **not considered in the current** General Engineering Requirements (Chapter 1 of the *Design Criteria for Sewage Works*)
 - a. Differences between funding agency requirements and Rule 400-40-02 requirements for treatment and non-treatment processes.
 - b. Different requirements for Preliminary Engineering Report (PER - funding agencies' primary requirements to identify best solution) and the Engineering Report (ER – required by Rule 400-40-02 emphasizing particular engineered solution).
 - c. Corrective Action Plan/Engineering Report (CAP/ER) engineering document requirements are often cited in Agreements and Orders without clarification of standards, objectives or scope.
- IV. **Inappropriately included material** in Chapter 1 of the *Design Criteria for Sewage Works*:
 - a. Technical material more appropriately included in the following specific technical sections were included in Chapter 1's "General Engineering Requirements."
 - b. Overall engineering document review considerations included only an emphasis on inflow and infiltration (I&I) reduction as a Divisional Priority.
- V. **Additions in the proposed revision:**
 - a. 4-step process required by Rule 0400-40-02 implemented with checklists **for treatment plant projects**. Steps are:
 - i. Preliminary Project Discussion → outline path forward for permitting and plans review and approval with TDEC, funding agencies, owners & engineers present
 - ii. Site Approval Phase → Assessment efforts for owner decision relative to discharge/disposal options and permit application
 - iii. Engineering Report & Preliminary Plans Submission (Preliminary Design Phase)

- iv. Final Plans, Contract Drawings and Specifications
 - b. Process emphasizes drafting NPDES/SOP permit prior to approval of Engineering Report and Preliminary Plans and emphasizes requirement that NPDES permit public comment period be complete prior to approval of Final Plans and Specifications as required by Rule.
 - c. Checklists for submittals provided for 4-step treatment process and for non-treatment processes.
 - i. Treatment → 4 step process required
 - 1. Conventional treatment (municipal)
 - 2. Decentralized treatment processes (predominately domestic)
 - 3. Industrial wastewater treatment
 - 4. Land Application of municipal wastewater effluent for tertiary treatment
 - ii. Non-treatment → only final submittal required
 - 1. Sewer Lift Station
 - 2. Gravity Sewers
 - 3. Force Mains
 - 4. Reuse systems
 - d. General Engineering Requirements for engineer submissions in accordance with Rules were matched and coordinated with CDBG, RDA and SRF review process requirements. Funding agencies are to be invited to Preliminary Project Discussions to increase coordination and reduce duplicate or uncoordinated work. Requirements match generally accepted engineering project management steps for consulting firms around the country.
 - e. PER requirements from Joint Federal Funding Agency documents and those published for the SRF Loan Program requirements were adopted and included in and integrated with the revised *Criteria* and differentiated from the ER requirement required by the Rule.
 - f. CAP/ER engineering objectives were identified and included.
 - g. Emphasis for review of engineering documentation was expanded to include not only I&I reduction but other currently relevant issues such as justification of new technologies, wastewater treatment plant optimization considerations, etc.
 - h. Name changed to clarify purpose of the *Criteria* to *Design Criteria for Review of Sewage Works Construction Plans and Documents*.
 - i. Format modified to comply with Department's format for Guidance Documents.
- VI. Critical elements **not changed** in the proposed revision of Chapter 1:
- a. Ultimate responsibility for the design resides with the engineer of record who seals the preliminary engineering report (PER), the engineering report (ER), and construction documents (plans and specifications).
 - b. The Design Criteria remains guidance on review of engineering documents leaving room for justification of processes and equipment outside the Criteria's "generally accepted wastewater engineering practices."

- c. Engineering document submission of non-treatment process projects may incorporate the 4-step process or proceed as previously allowed by submitting engineering report or calculations only at the final design submittal.

VII. **Benefits expected** to accrue from the revised section:

- a. **Submittal checklists** for general engineering requirements provided.
- b. Most detailed review occurs at the end of the preliminary design phase instead of at the final submission, **reducing the cost and time impact** on the design process. Final design which should focus only on sustainability, maintainability, expandability and reliability should be shorter when the schedule to bid is the most urgent.
- c. Objectives of **PER and ER differentiated** and clarified.
- d. **Guidelines for PER** provided and matched to funding agency requirements to **avoid duplication** of reports as much as possible.
- e. **Funding agency participation** in treatment process design review process up front should prevent last minute of permit and engineering report delays for approval.
- f. The Division's **emphasis remains on review and approval** of engineering documents, working with consultants to avoid impasses and disapprovals of proposal work if permit conditions allow.
- g. Emphasis on identification of **true life cycle costs** for projects.

VIII. Additional work to be done in the **future**:

- a. The discharge/disposal options and character assessment as part of the Site Approval phase is not well understood by the consulting community. Clarification of this aspect of the engineering design process needs to be included as an additional appendix to chapter 1. Coordination with engineering consultants and organizations has already begun and will be completed before this addition is proposed.
- b. Despite over a year of public presentations and website comments, there will inevitably be changes to checklists over the next year as they are used; the Division is prepared to be responsive to the consulting community so the *Design **Criteria continually reflects generally accepted wastewater engineering practice.***